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CENTRAL INTELLIGENCE AGENCY
INFORMATION REPORT

REPORT

STAT

COUNTRY USSR

DATE DISTR. 13 September 1948

SUBJECT Scientific Education

NO. OF PAGES 4

PLACE
ACQUIRED USSRNO. OF ENCLS.
(LISTED BELOW)DATE
INFORMATION May 1947SUPPLEMENT TO
REPORT NO.

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SOURCE Russian periodical, Uspokhi Khimii, No 5, 1947. (FIB Per Abs 4077--Translation specifically requested.)

THIRTY YEARS OF HIGHER CHEMICAL SCHOOLS IN THE USSR

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Moscow

In order to judge the gigantic work accomplished by the Soviet regime in the realm of culture, education of the masses, and development of science, it is sufficient to compare the statistical data for the period before the revolution with that of the present time. The number of institutions of higher education increased almost nine times; and the number of students six times. The number of secondary specialized educational institutions increased more than ten times; and the number of students in them 30 times.

There has been an exceptionally large increase of higher schools in the national republics. In prerevolutionary Russia the higher educational institutions were concentrated in the territory of the present RSFSR and Ukrainian SSR. In the other national republics there was not a single higher educational institution, with the exception of the Lithuanian, Latvian, and Estonian republics. At the present time in Central Asia alone (including the Kazakh and Kirgiz SSR), where there was not a single institution of higher education before the revolution, there are 75 higher educational institutions: of these, 33 are in the Uzbek SSR, and 23 are in the Kazakh SSR. There are 20 institutions of higher education in the Georgian SSR, 17 in the Azerbaydzhani SSR, and 13 in the Armenian SSR.

Higher chemical education underwent an especially strong development after the revolution. Prerevolutionary Russia had almost no chemical industry. Contemporary chemical industry was created mainly in the years of the first and second Five-Year Plans.

As early as 1936, 95.2 percent of all production of the chemical industry was produced by factories that had been newly built or completely reconstructed

- 1 -

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under the Soviet regime. The production of basic chemical products had increased immeasurably in comparison with 1930.

Higher chemical education grew and developed along with the development and growth of the chemical industry. Whereas higher chemical education was offered in prerevolutionary Russia at 15 institutions of higher education, at the present time the training of chemists and chemical engineers for various branches of national economy and culture is conducted in 160 higher educational institutions. In 30 state universities there are chemical faculties, under which highly qualified specialists for various branches of chemical science and technology are trained. In 15 polytechnical and industrial institutes there are chemico-technological faculties, which train chemical engineers for various branches of the heavy chemical industry.

In prerevolutionary Russia there was not a single special chemico-technological higher education institution; now we have 14 professional chemico-technological institutions. Furthermore in three institutes of light industry, two textile institutes, 11 institutes of the food industry, and in three institutes of forestry there are special chemical faculties training broadly educated chemical engineers for the separate branches of our chemical industry. Eighty pedagogical institutes conduct the training of teachers of chemistry for general secondary schools.

During the period of the Soviet regime more than 20,000 chemical engineers were turned out by professional chemico-technological institutes of heavy industry alone.

One of the brilliant workers of Soviet chemical science is Academician A. N. Bakh, author of the famous theory of oxidizing processes and of numerous researches on chemical changes in plant and living organisms, and the founder of scientific biochemistry.

Among the major Soviet scholars of the older generation in the field of organic chemistry are: A. Ye. Favorskiy, creator of isoprene rubber; Academician V. Ye. Tishchenko, who obtained synthetic camphor as a result of his labors; and Academician S. V. Lebedev, who developed a method for obtaining synthetic rubber.

A major representative of Soviet chemistry is Academician N. D. Zelinskiy, who created a large school of Soviet organic chemists. Along with him is working a group of his student, who have achieved great successes in the field of organic chemistry: Academicians S. S. Nametkin, A. A. Balandin, B. A. Kazanskiy, and other scholars.

Among the leading chemists who have made a great contribution to chemical science is one of the talented young organic-synthetic chemists, Academician A. N. Nesmeyanov, Director of the Institute of Organic Chemistry of the Academy of Sciences of the USSR, a major specialist in the chemistry of metalorganic compounds.

The works of Academician I. V. Rodionov created a new trend in the realm of organic chemistry: his researches have had wide application in the aniline-dye, pharmaceutical, and alkaloid industries of the USSR.

The researches of Academician A. Ye. Arbusov, in the field of organic compounds containing phosphorus; and of Academician A. Ye. Porey-Koshits, in the field of the chemistry and technology of dyestuffs, enjoy great fame in our country and abroad.

The specialized higher chemico-technological educational institutions created during the Soviet regime have played a decisive role in the development of the

- 2 -

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chemical industry. The chemical engineers trained in these higher educational institutions, together with the old specialists, have created the giants of the chemical industry: Stalinogorsk, Berezniki, and others.

The first professional chemical higher educational institution created after the October revolution was the Moscow Chemicotechnological Institute imeni Mendeleev. In the 30 years of its activity the Mendeleev Institute has become a first-class higher educational institution, turning out engineers for the chemical industry in all basic branches of industrial chemistry. Within its walls more than 6,000 engineers have been trained. Hundreds of serious scientific works have been carried out in this institute; highly qualified professorial and teaching staffs have been collected here including: Academician V. M. Rodionov, A. F. Kapustinskiy, Corresponding Member of the Academy of Sciences of the USSR; P. P. Budnikov, Regular Member of the Academy of Sciences of the Ukrainian SSR; Professor A. V. Kasatkin, Doctor of Technical Sciences; Professor N. M. Zhavoronkov, Doctor of Technical Sciences; Professor G. S. Petrov, Doctor of Technical Sciences; and others.

The Moscow Chemicotechnological Institute has been awarded the Order of Lenin by the government for its successful work in the training of personnel.

Much personnel for the chemical industry is trained by the Leningrad Chemicotechnological Institute imeni Iansovet, the successor of the Petersburg Technological Institute. The number of graduates of this institute before the revolution was insignificant: an average of 25 annually. After the revolution and especially after 1930, the average number of engineer graduates was 500 annually.

During the Soviet regime the Leningrad Chemicotechnological Institute has become a major higher educational institution, possessing magnificent technical equipment and highly qualified professorial and teaching staffs. Among the scholars of this institute one may mention: Academician A. Ye. Poray-Koshits; S. N. Danilov, A. A. Grinberg, and S. N. Ushakov, Corresponding Members of the Academy of Sciences of the USSR, and others.

For serving the chemical industry of the Donbass, the Dnepropetrovsk Chemicotechnological Institute, which has trained more than 1,200 chemical engineers, was opened; the same is true of the Rubzhansk Chemicotechnological Institute, created in 1935.

The Khar'kov Chemicotechnological Institute, founded in 1865, plays a great part in the training of personnel. More than 3,000 engineers have graduated from this institute, including 2,000 in the Soviet period.

The Kazan' Chemicotechnological Institute, created in 1930, has become an important scientific center for the training of highly qualified chemists for our industry. Chemists of the Kazan' school, continuing the brilliant tradition of their predecessors (Zinin, Butlerov, Zaitsev, and Shukovnikov), have made a great contribution to chemical science, and have trained more than 2,000 specialists for industry. The major representative of the Kazan' school of chemists is Academician A. Ye. Artusov.

The Institute of Fine Chemical Technology was organized in Moscow for the training of specialists in the field of fine organic and inorganic synthesis. At first there existed in this institute a chemico-pharmaceutical department and a department of chemistry of rare elements. Recently departments of technology of synthetic rubber, technology of rubber, and technology of fundamental organic synthesis have been opened in this institute. Outstanding scholars of our country who have taught in the Institute of Fine Chemical Technology include: Academicians M. D. Zelinskiy, S. S. Kasatkin, A. N. Nesmeyanov, and V. M. Rodionov, as well as Professor A. M. Berkhovskiy. This institute has turned out more than 1,500 specialists for our chemical industry.

The Ivanovo Chemicotechnological Institute was organized at the center of the textile industry in the city of Ivanovo; it has now become a major chemicotechnological institution, training personnel for various branches of chemical technology.

- 3 -

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In addition to the special chemico-technological higher educational institutions, the preparation of chemical personnel for our industry is also being carried on by polytechnical and industrial higher educational institutions. The chemico-technological faculties of such polytechnical institutes as the Tomsk, Kiev, Ural (at Sverdlovsk), Novocherkassk, Georgian, Yerevan, Donetsk (at Stalino), Gor'kiy, and others, have trained thousands of highly qualified chemical engineers for our industry. The professorial and teaching staffs of these institutes have conducted a number of serious scientific research works.

The Stalin plan provides for the further growth of the chemical industry. Together with the growth of industry and national economy, the number of specialists graduating from higher educational institutions will be increased. More than 600,000, including about 150,000 engineers, will be graduated during the Fourth Five-Year Plan. In addition, more than 1,300,000 specialists of medium qualification will be graduated, including more than 350,000 technicians.

To present these figures more clearly it is sufficient to point out that there are now 3 million specialists in all branches of national economy and culture. As a result of such an intensive work of the higher school, the concentration of specialists with higher education in the national economy will increase greatly in comparison with the prewar period. In 1940, for each specialist with higher education there were 36 workers and employees; in 1950, for each specialist there will be at the most only 25 workers and employees. In 1940, for each specialist with medium specialized education there were 21 workers and employees; in 1950, the ratio will be only 12 to one.

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- 4 -

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